

|A|A|A|S| Annual Meeting

26-31 January 1975

New York City

MEETING SUB-THEME: SCIENCE AND HUMAN ENVIRONMENT

SYMPOSIUM: ELECTRICAL RESPONSES OF PLANTS TO EXTERNAL STIMULI

ARRANGER: ARTHUR W. GALSTON

TITLE OF PRESENTATION: EVIDENCE FOR A PRIMARY PERCEPTION AT THE
CELLULAR LEVEL IN PLANTS AND ANIMALS

PRESENTER: CLEVE BACKSTER

AFFILIATION: BACKSTER RESEARCH FOUNDATION--SAN DIEGO

CO-PRESENTER:

AFFILIATION:

MEETING ADDRESS
OF PRESENTER: AMERICANA HOTEL

PLACE OF PRESENTATION: AMERICANA, ROYAL BOX

TIME AND DATE

OF PRESENTATION: 9:00 A.M. (WEDNESDAY) JANUARY 29, 1975

NOTE TO CORRESPONDENTS: RELEASE TIME IS TIME OF DELIVERY

BIOGRAPHICAL SKETCH OF CLEVE BACKSTER

Cleve Backster received his initial polygraph training directly from the late Leonarde Keeler. Prior to this specialized training, which was in 1948, he had been serving as an interrogation instructor in the U. S. Army Counterintelligence Corps at its Fort Holabird, Maryland headquarters.

From military service he accepted a position as an interrogation specialist with the Central Intelligence Agency. In 1949, as part of his duties as head of a section, he instituted the polygraph examination program, which is still active. Mr. Backster left the CIA to accept the position of Director at the Leonarde Keeler Polygraph Institute in Chicago, Illinois. In 1951 he founded Backster Associates, Inc. and he is also the founder of the Backster School of Lie Detection.

Prior to his founding the Backster Research Foundation, Inc. in 1965, he was chairman of the Research and Instrument Committee, a vital function of the Academy for Scientific Interrogation, a post to which he was reappointed for eight consecutive years. During his intensified research efforts, which started in 1958, Mr. Backster coordinated and refined the then existing polygraph techniques and contributed a new technique component which materially reduces the number of inconclusive polygraph examinations. In this regard he developed the Standardized Polygraph Examiner Notepack which has been widely adopted as a standard throughout the polygraph field. He also performed the necessary research to elevate the status of the psychogalvanic reflex (PGR) index to an equivalent of each of the other two polygraph indices.

In 1964, and again in 1974, Mr. Backster testified as a polygraph expert at the congressional hearings on polygraph conducted by the Foreign Operations and Government Information Subcommittee of the U. S. House of Representatives. In 1972 and again in 1974 he was elected to the Board of Directors of the American Polygraph Association, each time for a two year term.

In 1971, he was requested to join the select R. E. S. A. Speakers (Scientific Research Society of America), thus participating in the initial R. E. S. A. Lecture Bureau Program. He was then reappointed for further participation. Additionally, from 1970 to the present, he has lectured for the Sigma Xi Society.

On the occasion of the January 1975 presentation of his paper at the 141st annual meeting of the American Association for the Advancement of Science, the author will have been a professional observer of psychophysiological tracings (as related to the use of polygraph equipment on humans) for a period of twenty-seven continuous years. During the last nine of these years, he has experienced extensive involvement with observing the electrical responses of a variety of living plants and animals.

January 1975

Mr. Backster is currently the Chairman of the Research and Instrument Committee of the American Polygraph Association, and also the Chairman of the Research Committee of the California Association of Polygraph Examiners.

January 1977

|A|A|A|S| Annual Meeting

26-31 January 1975

New York City

MEETING SUB-THEME: SCIENCE AND HUMAN ENVIRONMENT

SYMPOSIUM: ELECTRICAL RESPONSES OF PLANTS TO EXTERNAL STIMULI

ARRANGER: ARTHUR W. GALSTON (YALE UNIVERSITY)

TITLE OF PRESENTATION: EVIDENCE FOR A PRIMARY PERCEPTION AT THE
CELLULAR LEVEL IN PLANTS AND ANIMALS

PRESENTER: CLEVE BACKSTER

AFFILIATION: BACKSTER RESEARCH FOUNDATION, INC.
1356 7TH AVENUE; SAN DIEGO, CALIFORNIA -92101-

DATE OF PRESENTATION: JANUARY 29, 1975 (9:00 A.M.)

The following black and white slide reproductions are provided by Backster Research Foundation, Inc. as visual reference for use in conjunction with available cassette tape recordings including the above titled presentation.

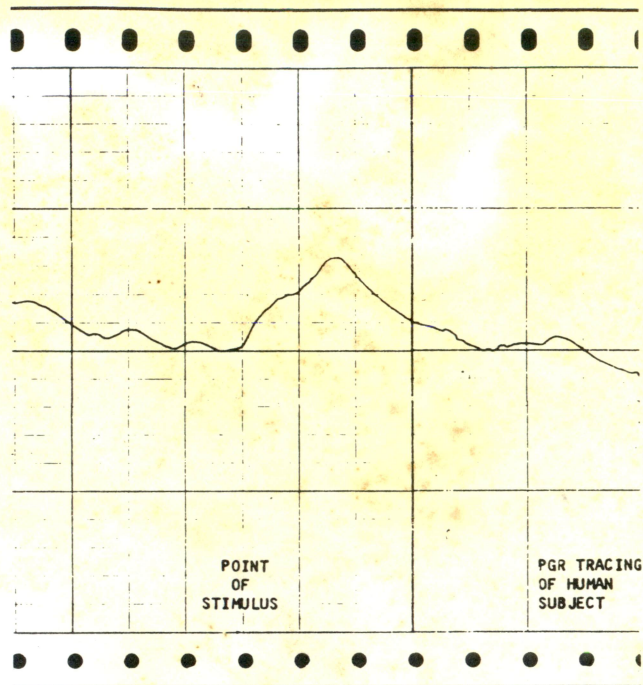
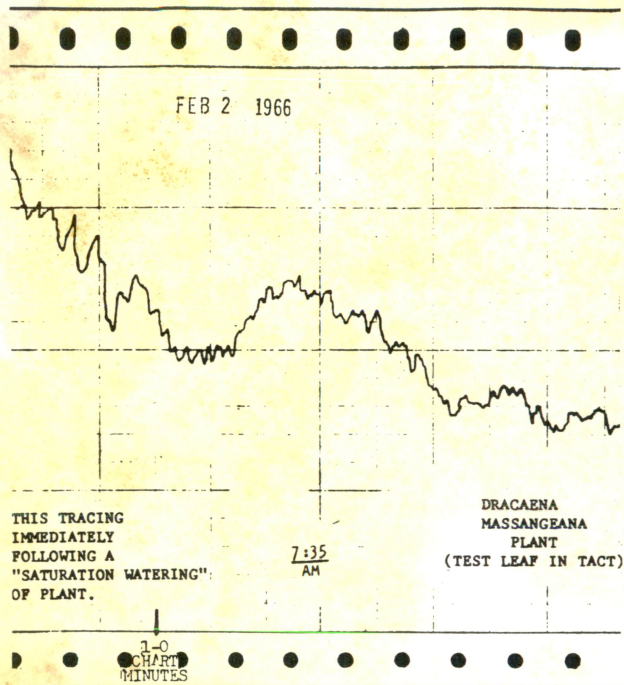


FIGURE 1

Left: Section of the February 2, 1966 plant monitoring chart which suggested to the author that the plant tracing contour resembled human tracings containing verified emotional arousals.

Right: A section of a chart exhibiting a verified emotional arousal in a human subject.

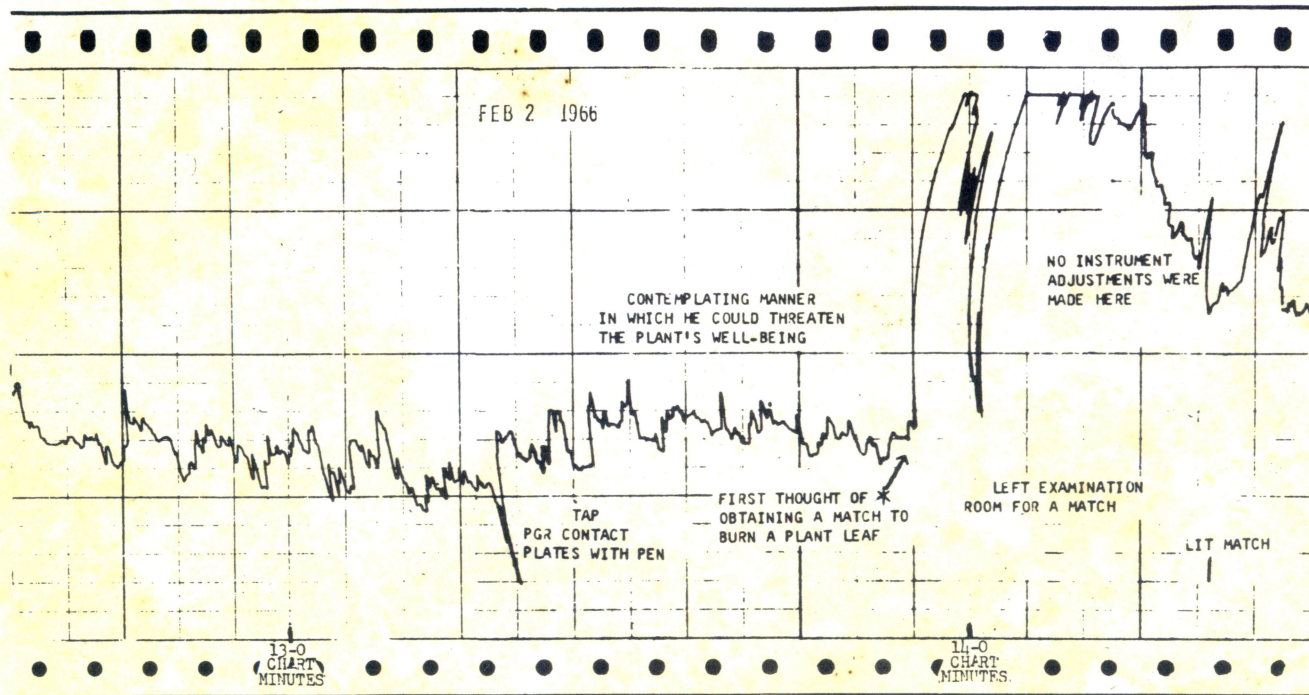
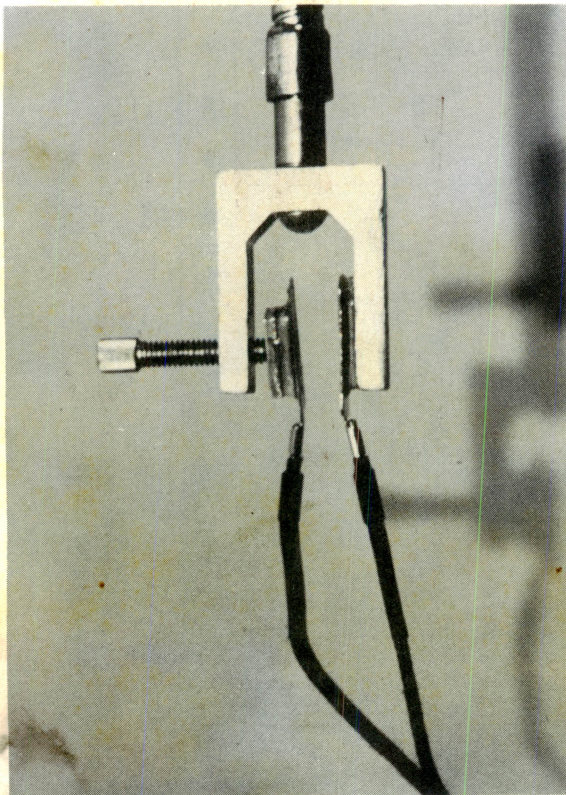
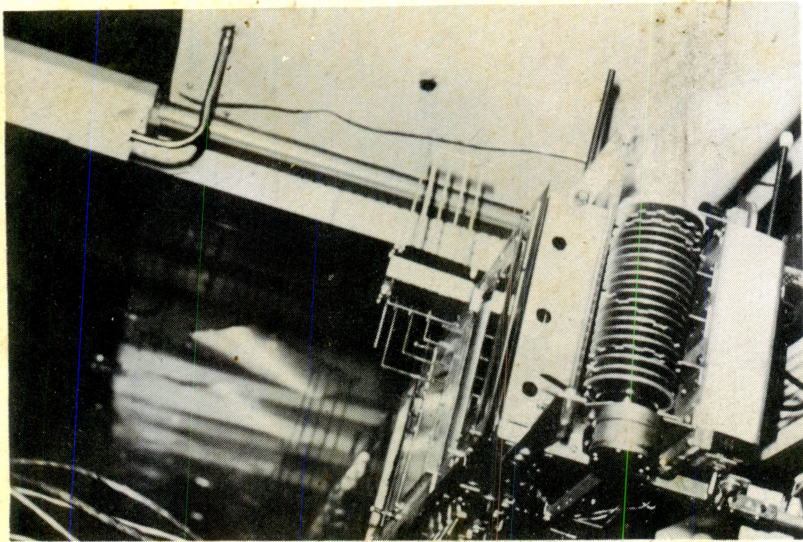


FIGURE 2

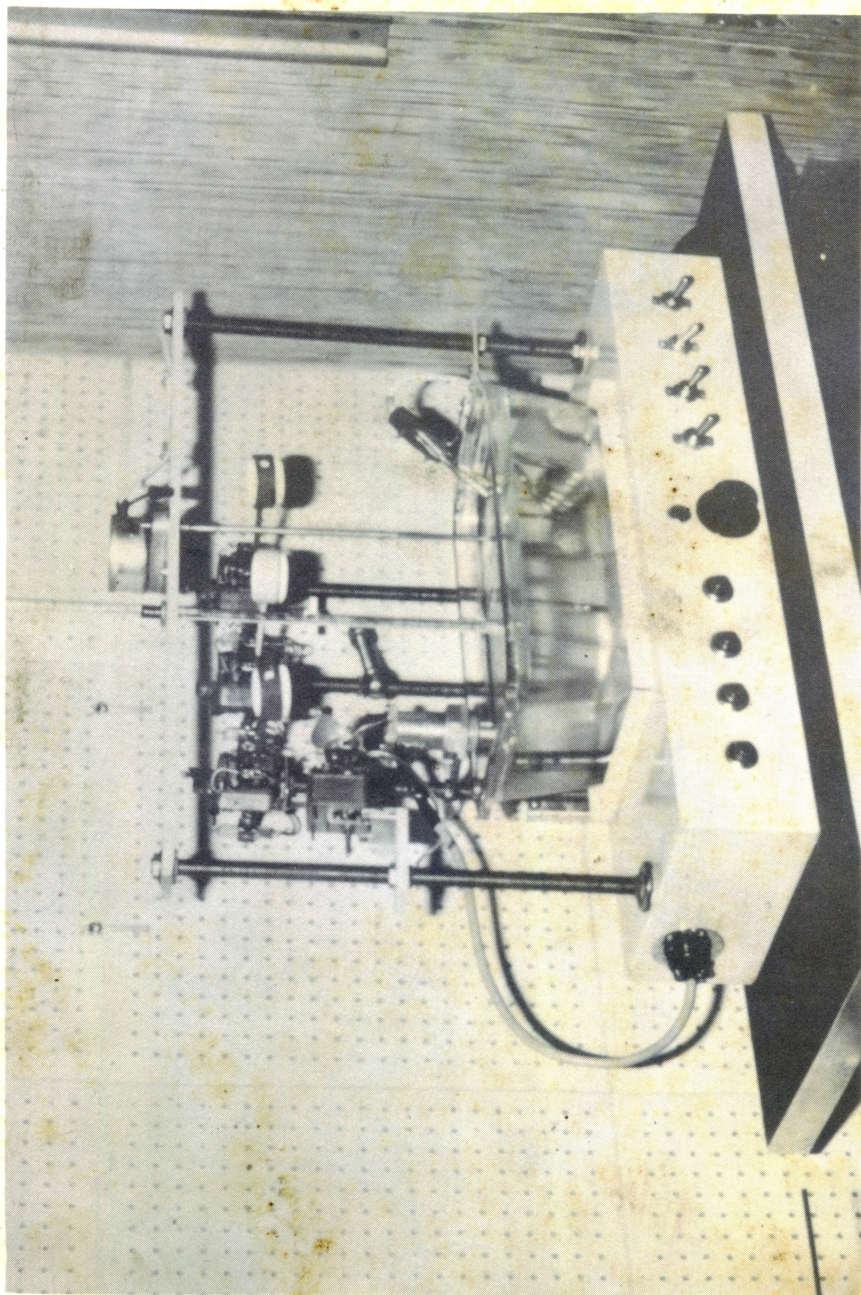
Section of the February 2, 1966 plant monitoring chart showing the reaction which occurred at the same time that the author thought of burning the plant leaf.



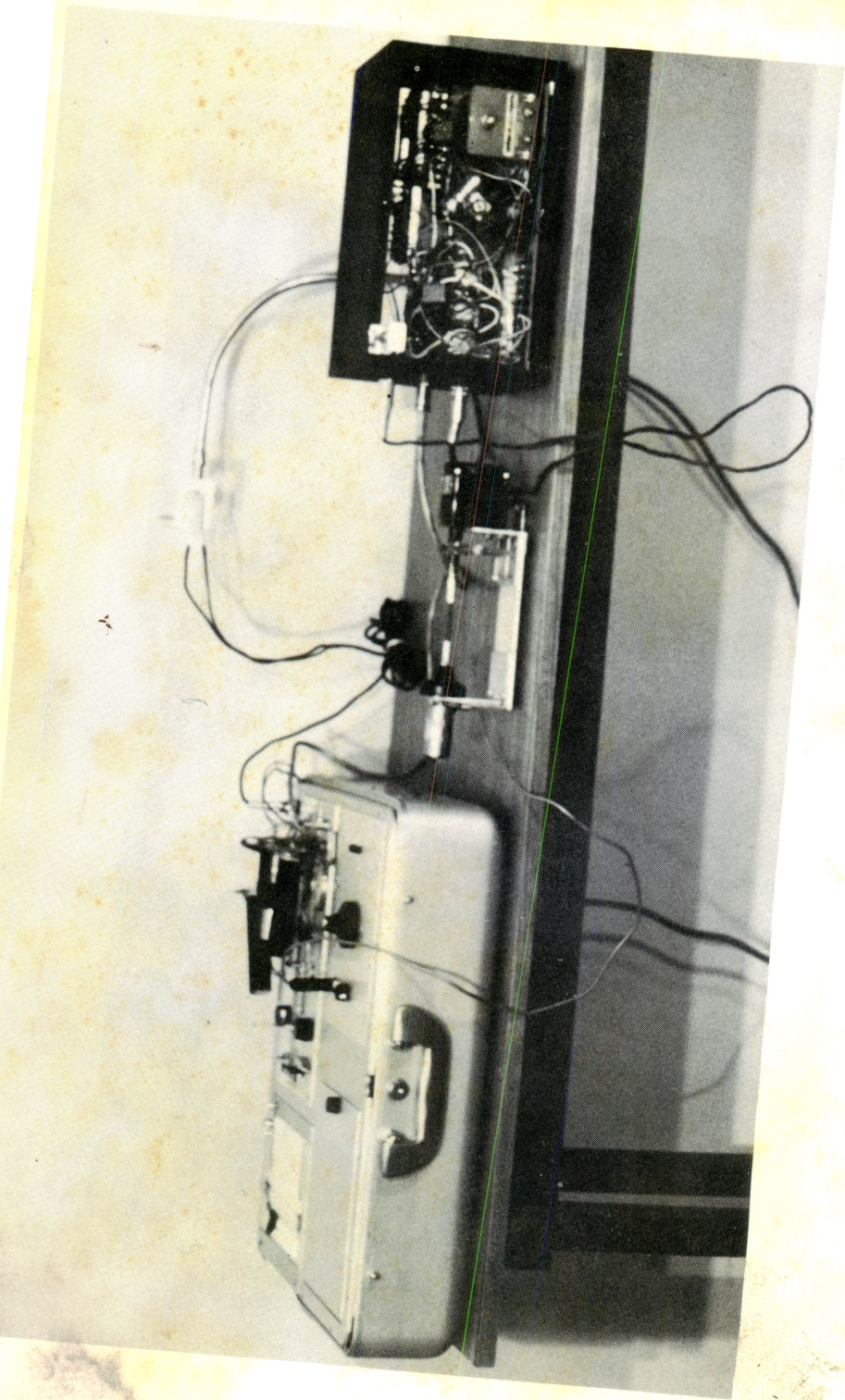
SLIDE 3



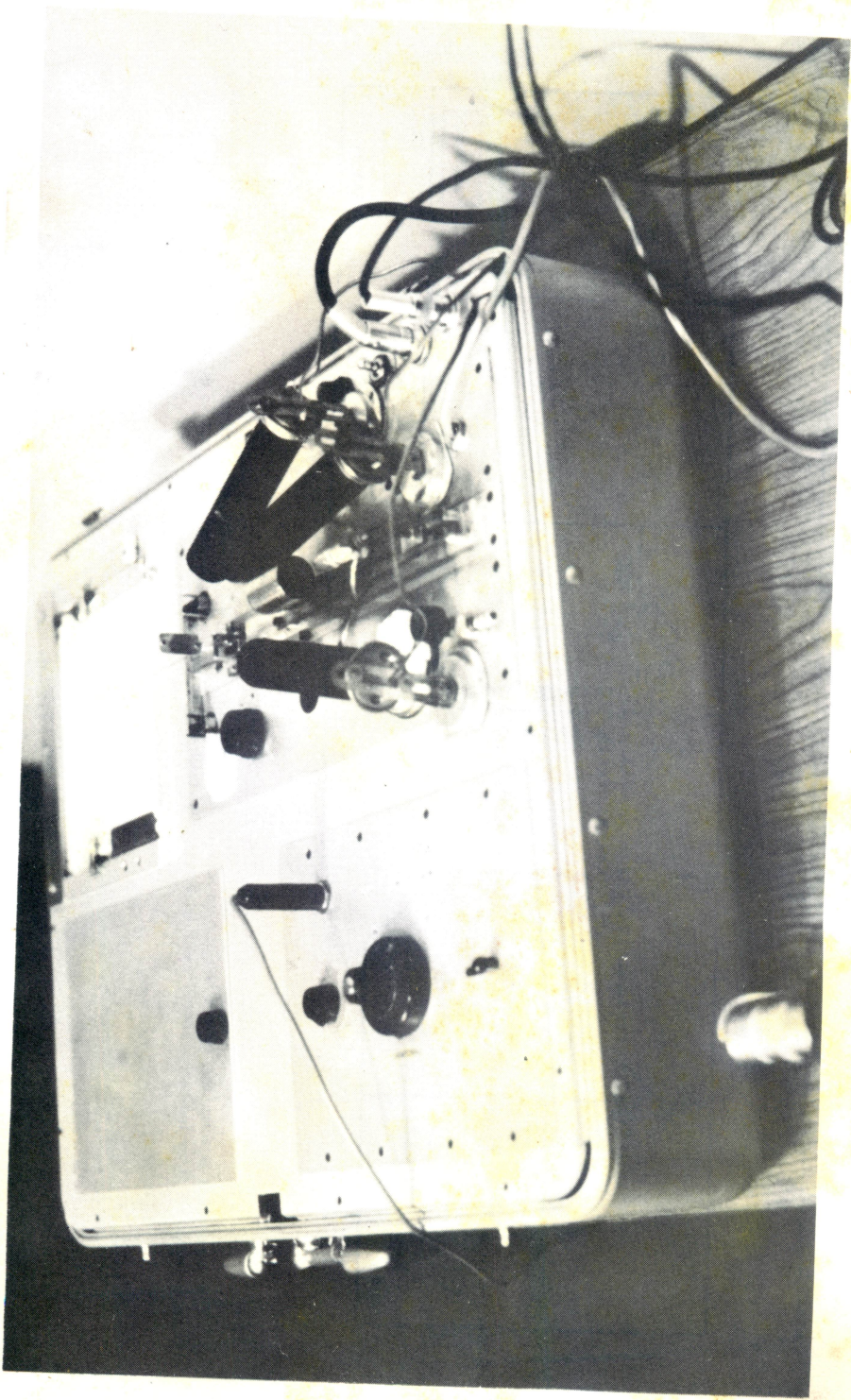
SLIDE 4



SLIDE 5



SLIDE 6



SLIDE 7

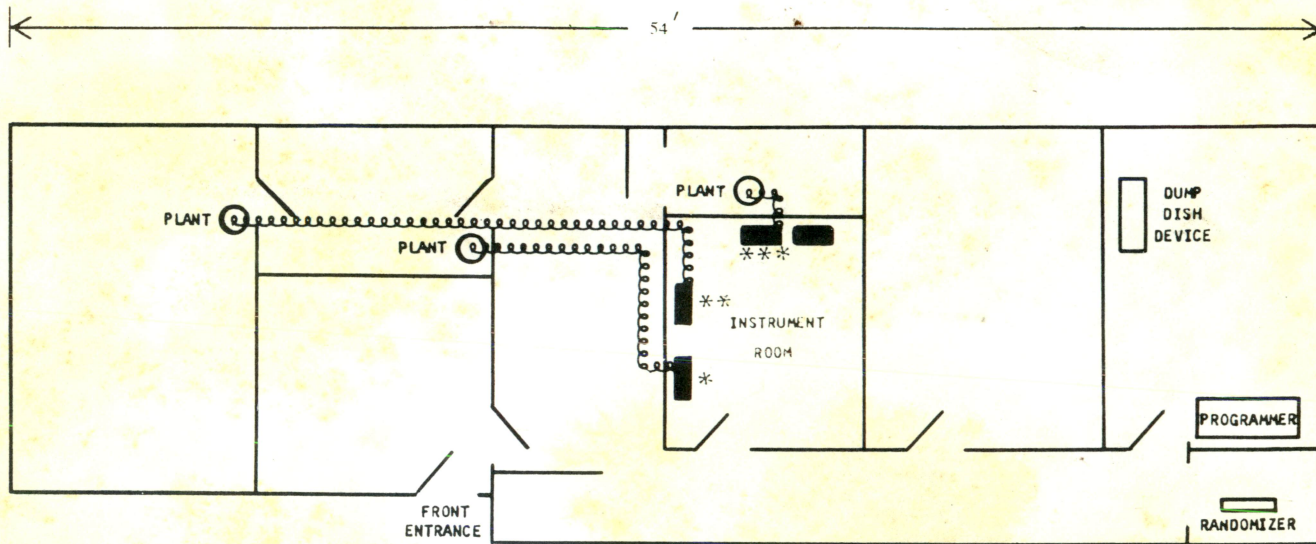
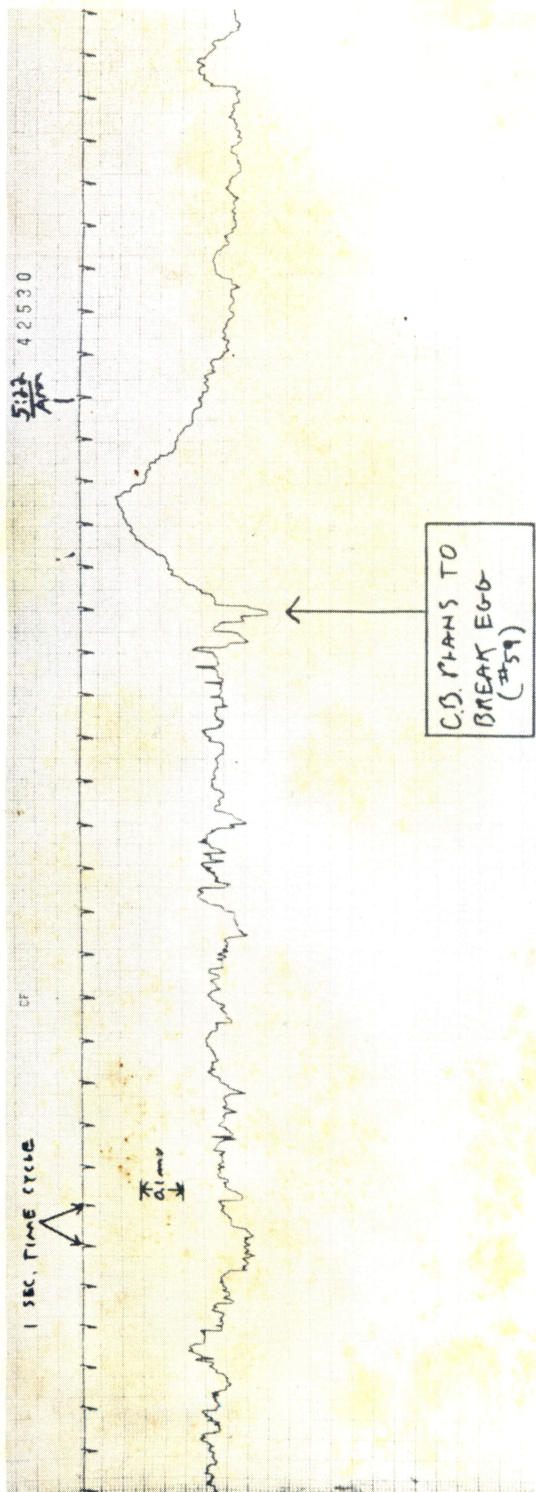


FIGURE 3

EXPERIMENT ENVIRONMENT

The randomizer selected the time when the programmer caused the dump dish device to terminate the brine shrimp. Instruments monitored plants as indicated above, by inter-connecting cables. The plants reacted when the brine shrimp were terminated.



AFRICAN VIOLET (WHITE)

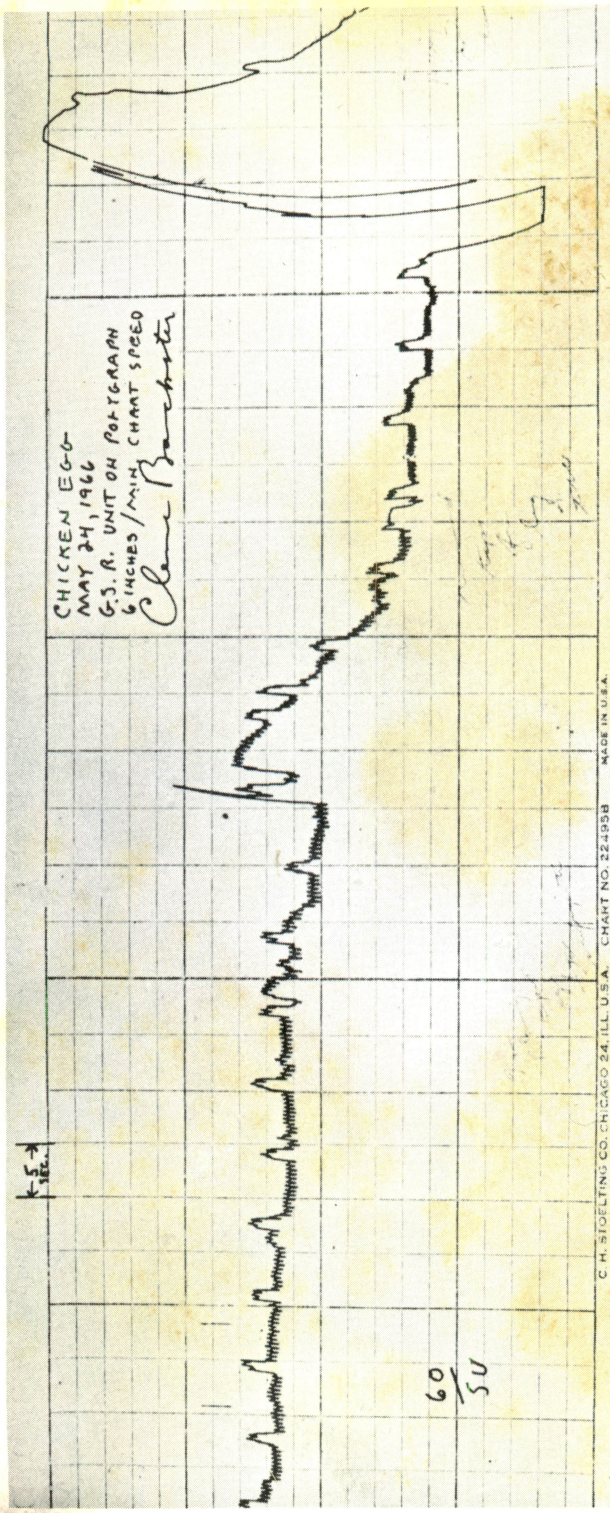
APRIL 31, 1972

100 25 0.2-50

GAIN 50 Hz

5 mm / SEC CHART SPEED

Chen B. B. B.



SLIDE 10

2198

2:57
Apr

1 SEC. TIME SCALE

OF

2:53
Apr

42199

2:52
Apr

CHICKEN EGG - NON FERTILE

APRIL 16, 1972

$$\frac{10}{\text{MIN}} \frac{20}{50} \frac{0.2-50}{\text{Hz}}$$

2 mm / SEC CHART SPEED

89°F

EXTERNAL ELECTRODES

Chen Barakat

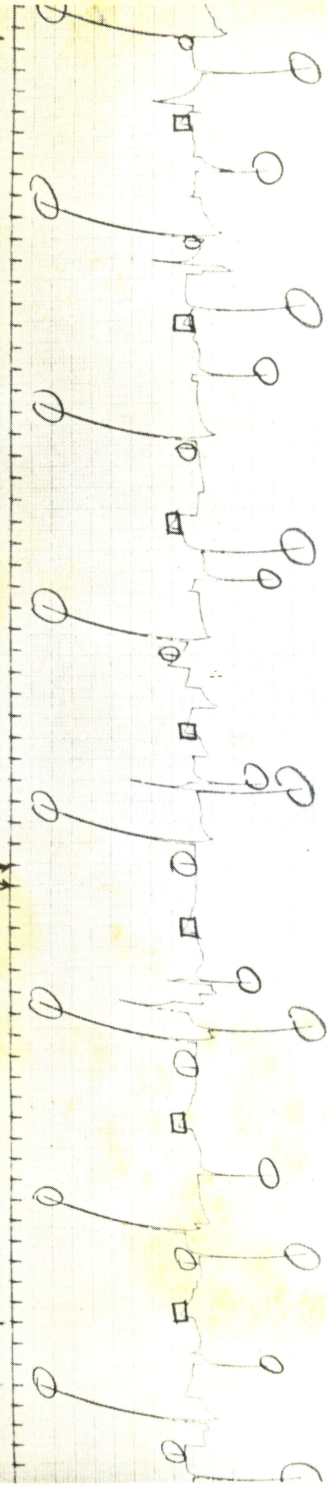
SLIDE 11

3:27 PM

44339

1 SEC. TIME CYCLE

3:28 PM



CHICKEN EGG — NON FERTILE
MAY 14, 1972 (MAY 13-16 SPOTCHECK)

100 25' 0.2-50
GAIN 50 Hz

5 mm / SEC CHART SPEED
93°F

EXTERNAL ELECTRODES

Chlorine Barometer

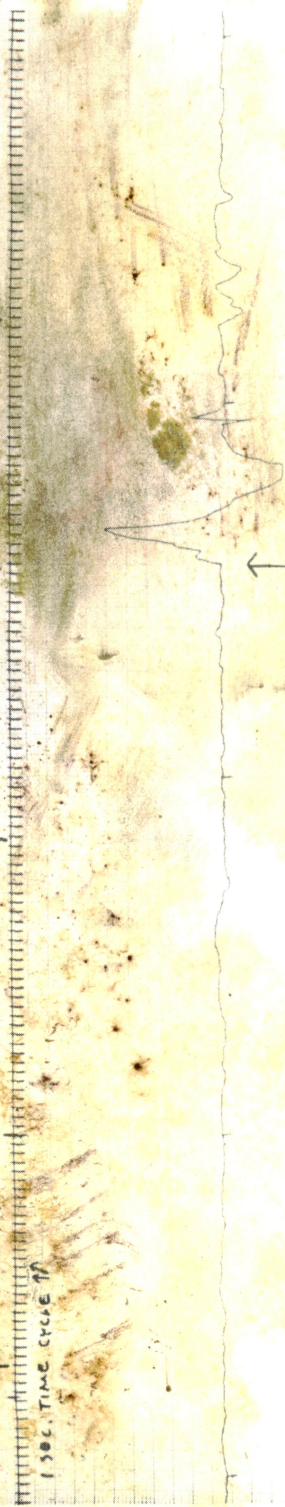
SLIDE 12

3:32
APR 19

3:32
APR 19

4:22 29

1 SEC. TIME CYCLE



C.B. PICKS UP "SAM"
(SIAMSE CAT)

CHICKEN EGG - FERTILE (FREDERICK, MD.)

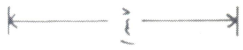
APRIL 19, 1972

$\frac{10}{\text{GAIN}}$ $\frac{75}{\text{SU}}$ $\frac{0.2-50}{\text{Hz}}$

2 mm / SEC CHART SPEED

89°F

EXTERNAL ELECTRODES



Chen Bernstein

42048

6:34 PM

1 SEC. TIME CYCLE

OF

6:35 PM

42049

6:36 PM



CHICKEN EGG - FERTILE

APRIL 11, 1972

10 75 0.2-50
GAIN SU Hz

2 mm / SEC SPEED

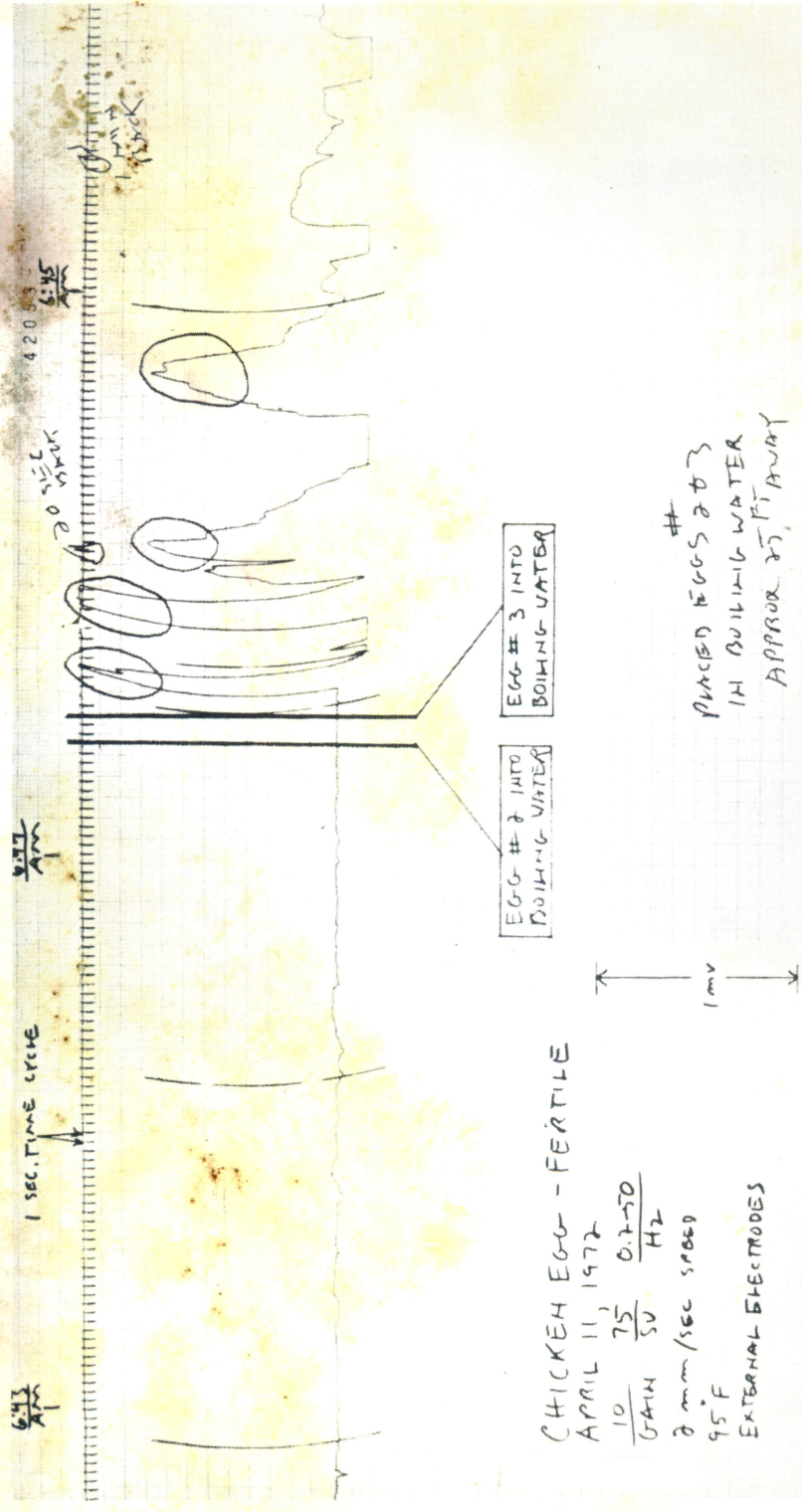
96°F

EXTERNAL ELECTRODES

Proportion
to time is with
frequency
(for frequency)

Ch. B. B. B.

SLIDE 14



CHICKEN EGG - FERTILE

APRIL 11, 1972

10 75 0.7-50
GAIN 50 Hz

3 mm/sec speed

95°F

EXTERNAL ELECTRODES

Chen Bancher

PLACED EGGS #2 & #3
IN BOILING WATER
APPROX 25 FT AWAY

HUMAN SPERMATOZOA

DECEMBER 3, 1972

100 100 0.7-50

GAIN SU 42

2 mm/SEC CHART SPEED

METAL INCUBATOR

96° F (APPROX.)

SILVER WIRE ELECTRODES

Clare B. Richter

DONOR SNIFFED
AMYL NITRATE
APPROX.
IN ROOM FROM
40 FT. FROM SAMPLE EGG.
MONITORED BY



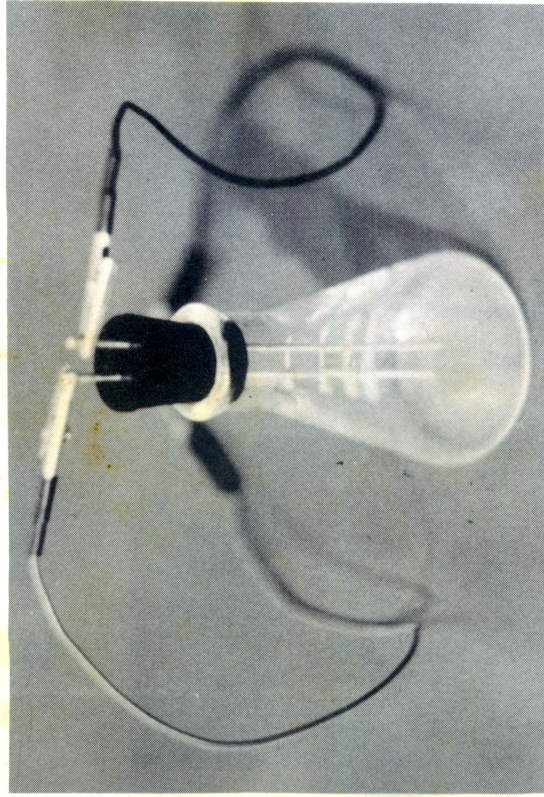
CAPSULE
CRUSHED

VAPOR
INHALED

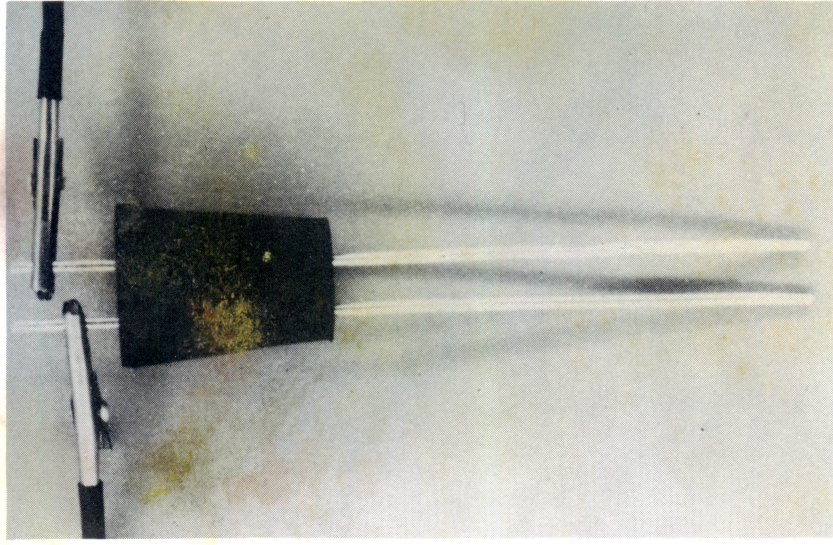
851-10

AM

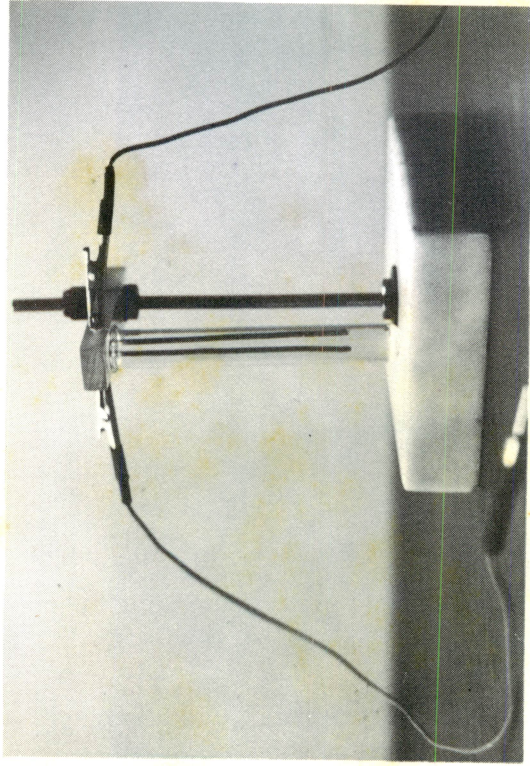
(DEC 3, 1972)



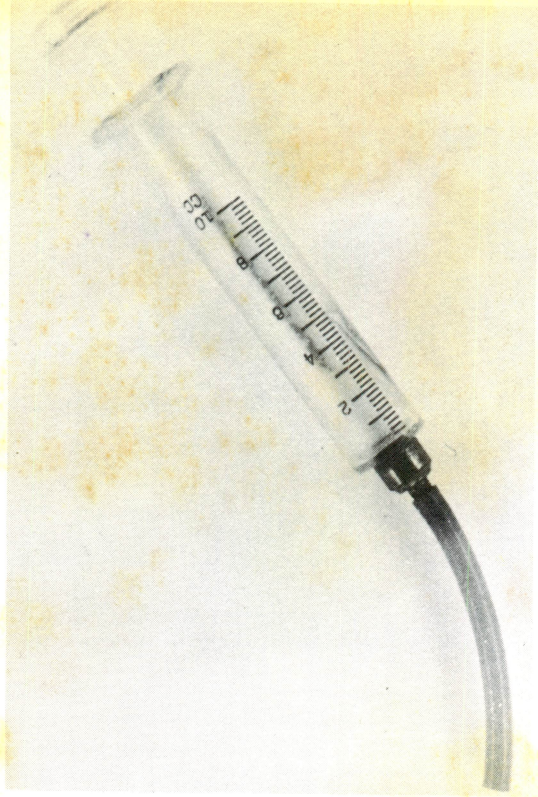
SLIDE 17



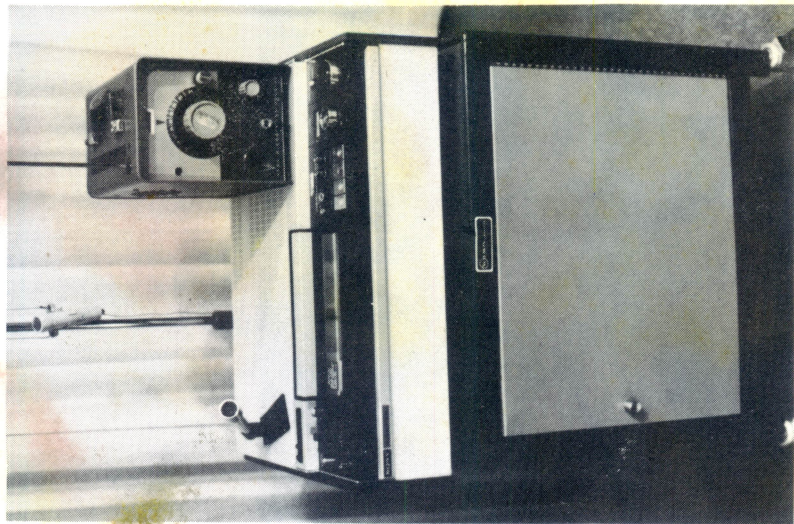
SLIDE 18



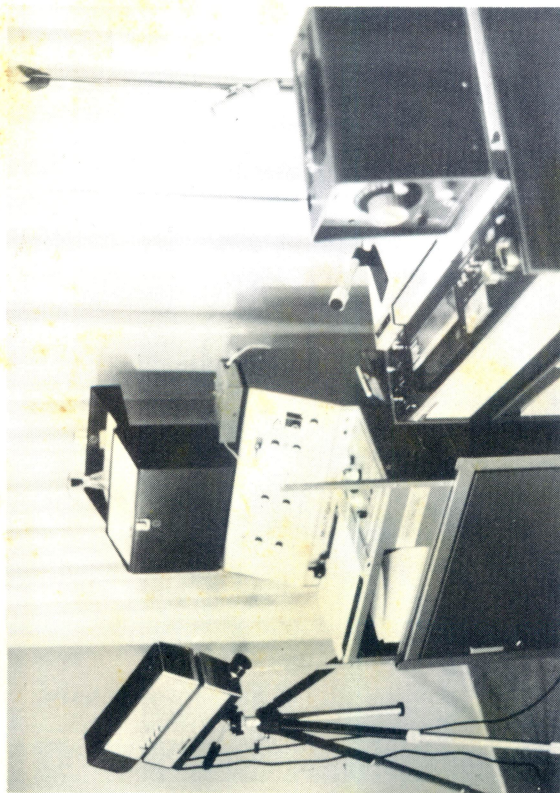
SLIDE 19



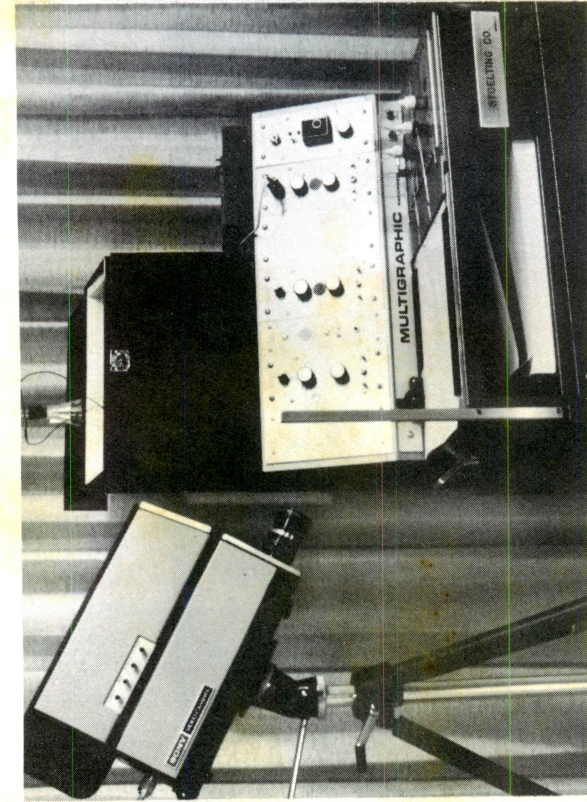
SLIDE 20



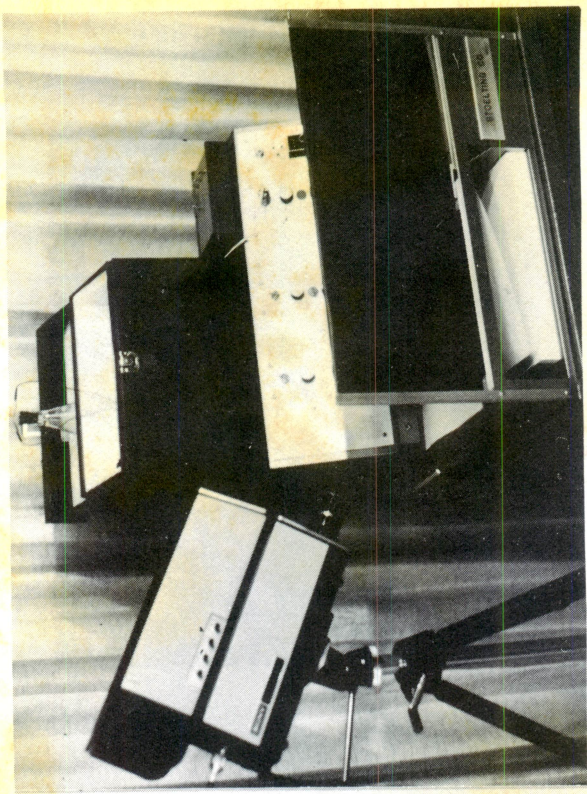
SLIDE 22



SLIDE 21



SLIDE 23



SLIDE 24

EEG
INSTRUMENTATION

RECORDING AMPLIFIER MODULE

SA-1472

The "Recording Amplifier Module" is the work horse of the Multigraph system. Great care was exercised in its design to insure the user maximum flexibility, minimum number of controls, high input sensitivity to handle most Stoelting transducers directly at a modest price. It also furnishes the excitation voltages for transducers. The controls consist of an "Amplitude" which controls the (gain) or (sensitivity) a "Centering" control for adjusting the position of the pen on the chart paper, a "Record" switch that applies the output signal to the galvanometer pen motor, a "Power" switch to turn amplifier "ON" or "OFF". A front panel mounted input connector receives plugs from transducers, etc.

SPECIFICATIONS:

(When used with SA-1470 Galvanometer Module.)

Pen Excursion 7 cm
Freq. Response ($\frac{1}{2}$ amplitude)..... 40 Hz
Damping.....adjustable..... 0.5 to 1.5
Linearity (angular) better than 2%
Centering (sensitivity \geq 5%) \pm 150 Full Scale

INPUT PARAMETERS

Sensitivity (Adjustable)..... 10-Mv-to 1.v Full Scale
Input Impedance..... 100 K ohms
Maximum Input Voltage..... \pm 9 volts

OTHER FEATURES

Output excitation \pm 9 volts @ 25 ma
(For transducers or signal conditioners)

MONITOR OUTPUT.....1-volt, full scale, DC-1.5KHz

(For oscilloscope Monitors) or Slave Units

OPERATES ON

115 volts, 60 cycles or 230 volts 50 cycles optional

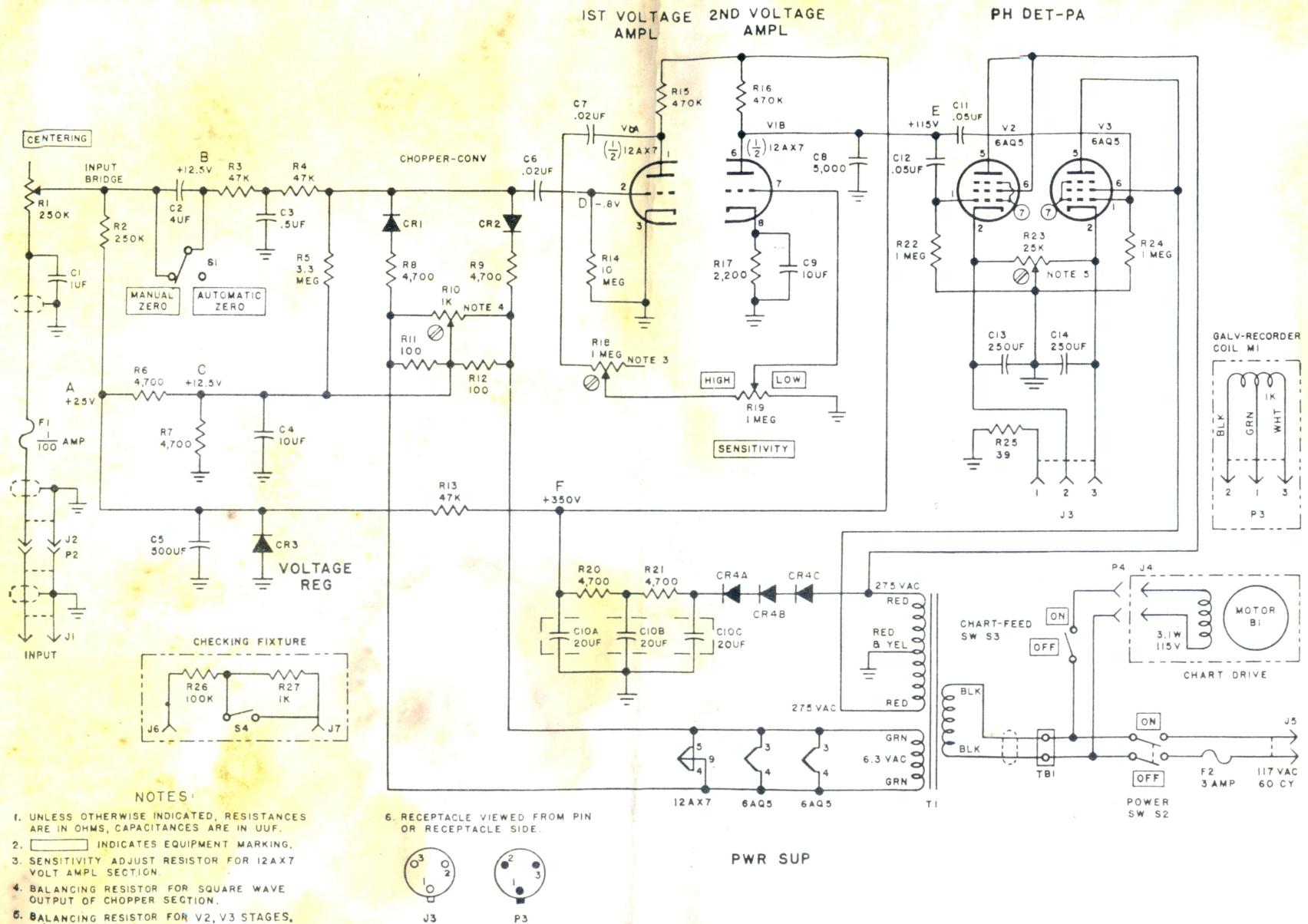
EEG
INSTRUMENTATION

SA-1475 BIOLOGICAL AMPLIFIER SPECIFICATIONS

A general purpose physiological amplifier suitable for ECG, EEG and EMG measurements. Electrodes must be selected for the application. Amplification, Frequency response can be chosen for best results. Low noise and high rejection of unwanted signals are featured. The amplifier is powered directly from the SA-1472 recording channel amplifier through the integral shielded cable provided. Specifications are maximum unless indicated.

| | |
|---|-----------------------------|
| AMPLIFICATION | selectable 10 or 100 |
| INPUT IMPEDANCE | 2 Meg Ohms |
| LOW FREQUENCY RESPONSE | selectable 0.2, 3, 10 Hz |
| HIGH FREQUENCY RESPONSE | selectable 50, 500, 5000 Hz |
| NOISE (3-500 Hz), ($R_s=0$, $A=100$) | 10 μ V P-P RTI |
| COMMON MODE REJECTION RATIO | 10,000:1 |
| INTERNAL CALIBRATION | selectable 0.1 or 1 mV |
| MAXIMUM INPUT VOLTAGE | ± 9 V |

A restore push button is provided



SCIENCE AND MANKIND CONFERENCE--UNIVERSITY OF MISSOURI, ST. LOUIS

Introduction of Cleve Backster

by

Dr. Charles R. Granger

(March 9, 1974)

A strange thing happened late one evening--or early one morning, depending on your time reference, on February 2, 1966.

Ah! You say that's when Cleve Backster discovered that plants have emotions. Perhaps.

But there is more to it than that. What you ask? Some pre-suppositions, as described by Professor Rigden last Thursday evening, of the Scientific community were brought under attack by an individual outside the science establishment.

Mr. Backster has devoted more than 25 years to research in application of the psychogalvanic reflex (PGR) in a variety of behavioral studies. During this time he has earned eminence in the field of polygraph operation. He developed the effective and widely used Zone Comparison Polygraph Technique. He has been associated with the U. S. Army and CIA as a polygraph expert.

He has been an expert witness at a Congressional hearing on polygraph usage in government. He is currently serving on the Board of Directors of the American Polygraph Association. In short, Mr. Backster is a world-recognized authority on the polygraph and polygraph usage.

Quite aside from his technical expertise Mr. Backster is also a teacher and it is through this interactive enterprise that Mr. Backster has been able to support his curiosity of nature.

A main question then arises: How could a man of this specialized background, that is--one who is not a botanist or plant physiologist trained in academic protocol--have the audacity to challenge the presuppositions of the established scientific community? Heresy, you say? Perhaps.

On that morning in 1966 did Cleve Backster have on his mind to prove that plants can preceive emotions? No!

After working on a polygraph technique for some hours he decided to take a break and water some of his office plants. Being a curious individual he thought it would be interesting if he could hook up his polygraph to a plant to see if he could determine how fast the water moved up the plant. A naive question, some might think.

He had not written a grant proposal or signed a contract for money with a preconceived notion of proving or disproving anything. He was not practicing grantsmanship, the common practice among too many scientists of the established community. Mr. Backster was just attempting to satisfy his innate curiosity about his natural environment.

The genius of his activity that early morning lay not in the statement of a problem or in the formulation of a hypothesis but rather in his perception of his environment and the recognition of the unusual. His mind had the ability to bridge the traditional presuppositions existing about plants at that time. He, in fact, was being creative in the scientific sense.

How was this "transgression" by an outsider taken by establishment scientists? As you might expect from a community of "open-minded" scholars--it was mostly rejected. And I might add rejected without additional independent research of their own.

It sounds if I may be telling a story--from the history of science--that you may have heard over and over again.

What about the reception of the unique ideas of Galileo? Copernicus, Darwin, Dalton, Newton and Einstein?

Do you see any parallels between their problems of initiating new ideas and those of Mr. Backster?

Are we falling into the trap of rejecting what is new because it doesn't follow our present presupposition of plants and animals and their behavior? Perhaps.

Is there, in fact, such a phenomenon as plant emotions? Perhaps there is.

And now may I introduce Mr. Cleve Backster.

Charles R. Granger, PhD
Assistant Professor of
Biology and Education
University of Missouri - St. Louis

Previously:

Assistant for Academic Affairs
Division of Biological Sciences
Cornell University
Ithica, New York



THE BACKSTER RESEARCH FOUNDATION, INC.

1356 7th Avenue
San Diego, California 92101

NEW ADDRESS
861 SIXTH AVENUE
SAN DIEGO, CA 92101

EVIDENCE FOR A PRIMARY PERCEPTION AT THE CELLULAR LEVEL IN PLANTS AND ANIMALS

by Cleve Backster

At this time I wish to express my appreciation to the American Association for the Advancement of Science and to Professor Arthur W. Galston for the opportunity to participate in the symposium which he is chairing during this 141st annual meeting of the A.A.A.S.

On the occasion of this January 29, 1975 symposium an attempt will be made to assess progress to date, as related to exploration of my primary perception hypothesis. A bibliography containing more than a hundred references selectively annotated is provided as an adjunct to this report. Supplementary material is also being provided that presents the scope of interaction with the scientific and academic community during the past seven years in the primary perception field. A third supplement reflects the considerable involvement of Soviet scientists in research germane to the author's hypothesis.

Previously Published Work

To place this current work in proper perspective, the author concluded in his research report* entitled "Evidence of a Primary Perception in Plant Life" that the significance of the results of the experiment "... provides evidence of the existence of a yet undefined primary perception in plant life, indicates that animal life termination can serve as a remotely located stimulus to demonstrate this capability, and illustrates that this facility in plants can be independent of human involvement."

"Based upon Backster Research Foundation observations during a period of approximately three years [prior to 1968], and on research currently in progress, the author hypothesizes that this perception facility may be part of a primary sensory system capable of functioning at cell level. This is further suggested by observation of its apparent presence in plant and animal tissue separated from an organism (including human), and maintained in vitro where the specialized senses are not present."

"The overall implications derived from explorations to date seem important, but they also reveal the present inadequacy of answers relating to the basic nature of this phenomenon, its fundamental characteristics, its geographical limits, its mode of transmission, its susceptibility to shielding, its influence on matter, its information retention capabilities, its stimuli discrimination capabilities..."

* International Journal of Parapsychology, Winter, 1968, pp 344-346.

Replication of Initial Experiment

It is noted that a fellow speaker later in this symposium, Dr. John M. Kmetz, is scheduled on the program to give a presentation he entitled "Attempted Repetition of the Backster Experiments." If his current state of attempted progress is accurately reflected in his summary forwarded to A.A.A.S. on November 11, 1974--in which he states he followed "all" of Backster's suggestions for getting a successful plant response to termination of brine shrimp and also stated that "despite all the above precautions that data indicates no correlation between life terminations of brine shrimp and plant responses"--I then must respectfully request a brief period for rebuttal, as this attempted replication is in serious default because of unacceptable non-adherence to important aspects of instrument modification and automation requirements as unambiguously stated in the published report "Evidence of a Primary Perception in Plant Life."

It must also be added that the author knows of no precise attempt to date to replicate in accordance with those same strict standards. It may be that most of the difficulties encountered by those attempting replication involve one or more of the following: (a) failure to automate the experiment adequately in the prescribed manner (b) failure to utilize healthy brine shrimp as a remote stimulus via sacrifice; (c) failure to properly isolate plants prior to usage as required by the experiment design; (d) substitution of the basic type of instrumentation prescribed; and (e) failure to modify standard instrument performance as specified in regard to the recording pen repositioning feature (thus avoiding the "automatic mode" instrumentation circuitry).

Subsequent Changes in Methodology

Shortly after publication of the above-referenced report, it became increasingly apparent that although the initial research instrumentation was principally designed to indicate and record resistance changes (direct current, Wheatstone bridge circuit), the chart tracings obtained were more related to electrical potential phenomena emanating directly from the plant leaf tissue than to resistance changes. This was further confirmed in early 1970, when I found that use of "alternating current" resistance recording instrumentation failed to provide the plant leaf tracings previously obtained without that instrumentation. Subsequent confirmation occurred when EEG instrumentation was found to provide significant plant leaf tracings.

Current Cellular Level Experimentation With Plants

The Backster Research Foundation is now directing considerable effort toward designing an experimental approach to primary perception that will more easily lend itself to replication. To this end, custom made or otherwise difficult-to-obtain equipment is being avoided and EEG instrumentation is being utilized. Also, a less complex form of plant life, lower in the evolutionary scale, has been selected; namely, bacterial cultures. Further, the life termination remote stimulus is being replaced by a nutrient reward stimulus. On random, machine-selected occasions, nutrient is to be automatically injected into a non-electroded bacterial culture in one incubator, while EEG readings are recorded from an electroded bacterial culture in a second incubator located at a distance in the same experiment-environment.

Finally, it is appearing essential that the experiment be completely programmed and automated in a manner allowing the researcher to be absent from the laboratory area during lengthy periods involving repeated nutrient feeding.

Current difficulties center on finding substitutions for the unsatisfactory Ag-AgCl electrodes, which appear to eliminate data picked up by untreated silver wire electrodes. These latter, on the other hand, are satisfactory for observations during short time periods (30 to 45 minutes), but become coated too quickly with insulating materials to allow for adequate long-term environment monitoring.

Current Cellular Level Experimentation With Animals

Based on numerous observations of EEG test patterns emanating from unincubated chicken eggs, human sperm, and specialized animal tissue *in vitro*, we are pursuing EEG monitoring of animal life. This is being conducted at cellular level and also with unicellular animal organisms.

As a working hypothesis we are proposing the existence of a primary animal life communication system in addition to communication by way of the nervous system or the chemical messenger (chemotaxis) facility. We conjecture that on a selective need-to-communicate basis, this primary intercellular communication occurs within the same organism. If this working hypothesis is later validated, the implications as applied to research in the field of immunology, for example, seem potentially rewarding. It appears to this researcher that one of the information gaps in current immunology theory involves the occurrence of apparent communication that cannot easily be attributed to either the nervous system or, in any explicit sense, to the chemical messenger system.

Current Means of Eliciting Significant Spontaneous Observations

As a substantial aid in preliminary experimentation with the primary perception hypothesis, I have introduced closed circuit TV, in order to deal with possible apparent interactions between human consciousness and the biological life forms being studied, as such interaction would have the potential of distorting tracings received.

One approach we have found productive involves creating a delayed-playback environment monitor system. Such a system involves two basic elements. While the researchers are engaged in attempting to provoke tracing responses, a videotape camera mounted over the instrumentation chart read-out allows later playback of the tracings produced, while simultaneously an audio sound-track is made of all conversations and descriptive narrations of the attempts to provoke spontaneous responses. In addition to this system it has been found essential to block the researchers' view of the tracings. Hence we use an opaque screen.

Additionally, we have found that a remote, mobile radio communication system (e.g. VEGA), with the audio receiver jacked into the videotape soundtrack input, adds a new dimension in recording spontaneous observations. The researcher is allowed freedom of movement away from restrictive conditions of a fixed microphone.

Suggestions for Future Experimentation

Quite frankly, I am under no illusion to have proven the suggested hypothesis to date. However, given the importance and obvious implications of the ever-increasing observational data available, it would be appropriate that the responsible scientific community should concurrently participate in more such experiments, following a learning period of careful observations of both phenomena and instrumentation. This period is a must before too premature rigidity of experiment format is assumed.

In closing I thank The American Association for the Advancement of Science for providing the opportunity to present this interim progress report, and trust that future opportunity will be provided allowing subsequent reports on this ongoing research.

End